(a) $v(t)$? $a(t)$?

$p(t) = 3t^4 - 16t^3 + 24t^2$

$v(t) = p'(t) = 12t^3 - 48t^2 + 48t$

$= 12t(t^2 - 4t + 4)$

$a(t) = v'(t) = p''(t) =$

$36t^2 - 96t + 48$

$\frac{dt}{dp} p(t) = 3(f'(t^4)) - 16(f'(t^3)) + 24(f'(t^2))$

$\frac{d}{dt}(p(t)) = p'(t)$ $3(4t^3) - 16(3t^2) + 24(2t)$

$v(t) = 12t^3 - 48t^2 + 48t$

$\frac{dt}{dv} v(t) = 12(f'(t^3)) - 48(f'(t^2)) + 48(f'(t))$

$12(3t^2) - 48(2t) + 48(1)$

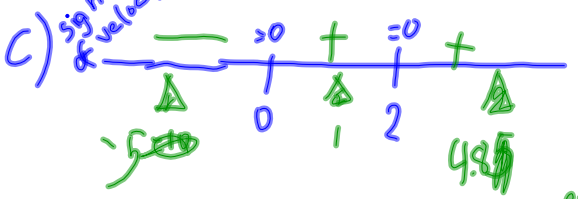
$a(t) = 36t^2 - 96t + 48$

b) $v(t) = 12t(t-2)(t-2) = 0$ $12t^1(t-2)^2$

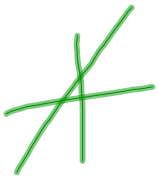
Multiplicities

$\Rightarrow t = 2, 0$

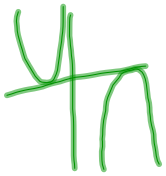
c) sign chart of velocity



1



even



d) $a(t) = 12(3t^2 - 8t + 4)$

$= 12(3t-2)(t-2)$

$a(t) = 0$

$\Rightarrow t = \frac{2}{3}, 2$

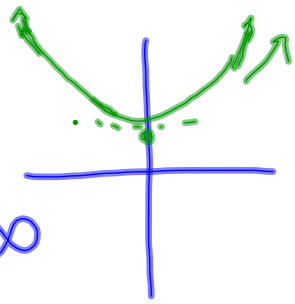
odd >1

$v(\frac{2}{3}) = 12(\frac{2}{3})^3 - 48(\frac{2}{3})^2 + 48(\frac{2}{3})$

STOP

do not simplify

1969 AB7) $y = \frac{e^x + e^{-x}}{2}$



$\lim_{x\to\infty} \frac{e^x + e^{-x}}{2} = \lim_{x\to\infty} \frac{e^x + \frac{1}{e^x}}{2} = \infty$

$\lim_{x\to-\infty} \frac{e^x + \frac{1}{e^x}}{2} \neq \infty$ (as $e^x \to 0$, $\frac{1}{e^x} \to \infty$)

y-int

y-int: $\frac{e^0 + e^{-0}}{2} = 1$

$y = \frac{e^x + e^{-x}}{2} = \frac{1}{2}e^x + \frac{1}{2}e^{-x}$

$y' = \frac{1}{2}(e^x) + \frac{1}{2}(-e^{-x}) = \frac{e^x - e^{-x}}{2}$

$y' = 0$?

$e^x - e^{-x} = 0$

$e^x \cdot e^x = e^{-x} \cdot e^x$

$e^{2x} = 1 \to 2x = 0 \to x = 0$

$e^{2x} = e^0$

aside

$\lim_{x\to-\infty} e^{-x} =$

$\lim_{x\to-\infty} \frac{1}{e^x}$

$-1 \quad \frac{1}{e^{-1}} = e^1$

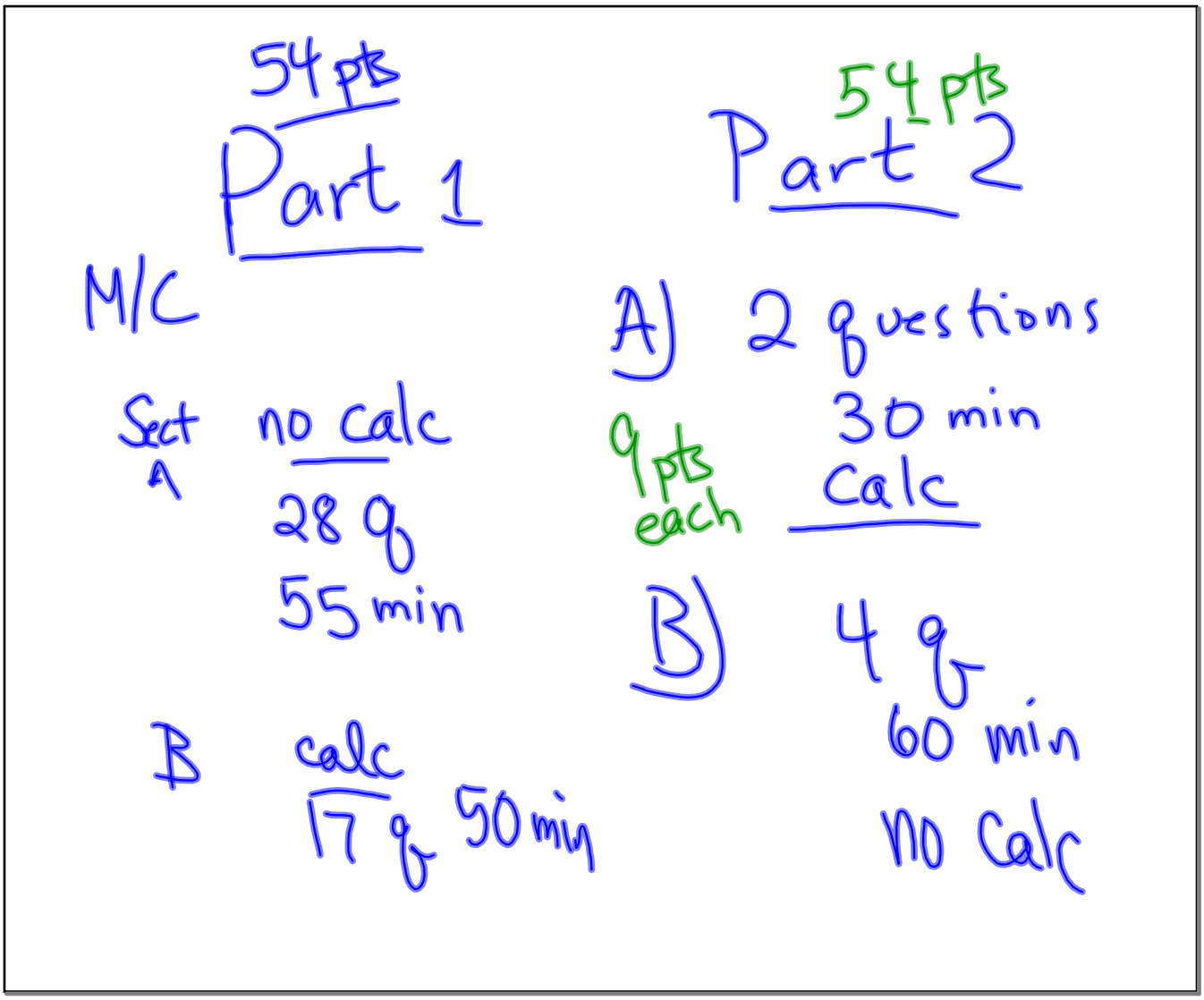
$-10 \quad = e^{10}$

$-1000 \Rightarrow e^{1000}$

$y = \cosh x$

"The hyperbolic cosine"

Oct 16-7:36 AM


54 pts
Part 1
M/C
Sect A
no calc
28 q
55 min
B
calc
17 q 50 min
54 pts
Part 2
A) 2 questions
30 min
Calc
9 pts each
B)
4 q
60 min
no calc

Oct 16-7:36 AM